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CH2M HILL Engineers Planners Economists Scientists

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January 26, 1990

Mr. D. N. Mendenhall
Water Quality Engineer
Longview Fibre Company
P. O. Box 639
Longview, Washington 98632

Subject: Summary Report of Recent Field Investigation Results Seattle Plant

Dear Dave:

This letter report summarizes the results of field investigations conducted at the Longview Fibre Company (LFC) Seattle plant in 1989. These investigations were undertaken by Longview Fibre pursuant to correspondence and meetings with the Washington Department of Ecology (Ecology).

FIELD INVESTIGATION SUMMARY

GROUNDWATER SAMPLING

The three monitoring wells (Figure 1) at the LFC Seattle plant were sampled on August 8, 1989 to determine total petroleum hydrocarbon (TPH) concentrations in groundwater. Analytical results for TPH are presented in Table 1. No TPH was detected in MW-2, a trace in MW-1, and a very high concentration in MW-3. It should be noted that floating oil was present in MW-3, and that the TPH result represents hydrocarbons dissolved and suspended in water from this well.

The August 8, 1989 results agree with prior sampling rounds (completed December 7, 1987 and February 26, 1988) in that little or no TPH was found at the MW-1 and MW-2 locations, and floating oil and a correspondingly large TPH concentration was detected at MW-3. TPH concentrations for wells MW-1 and MW-2 have always been below the 15 mg/L water cleanup level presented in the August 1, 1988 Ecology "Policies and Procedures for Underground Storage Tank Removal."

Field procedures and field parameter measurements for the August 1989 sampling event are provided in Attachment A. Laboratory reports and chain of custody forms are included in Attachment B.

TEST PIT INVESTIGATION IN VICINITY OF WELL MW-3

Additional investigation in the vicinity of monitoring well MW-3 was undertaken to assess the extent of oil floating on groundwater in the vicinity of this well. A work plan to carry out this investigation by means of test pits was completed on October 6, 1989 and reviewed by Ecology. The test pit excavations were completed between October 20 and 23, 1989, with a rubber-tire backhoe operated by a subcontractor, Church Construction. Geologic logs of these test pits are given in Attachment C to this report.

Initially, three pits were dug at distances of 10 feet to the north, west, and south of MW-3. Observation of a thin layer of floating oil in these first three pits resulted in excavation of four additional pits at further distances from well MW-3. Soil removed from the test pits was segregated into contaminated and uncontaminated piles on the basis of field organic vapor (HNu) readings. Selected soil samples were retained for laboratory analysis of TPH.

The pits were left open to facilitate visual monitoring for floating oil. Perforated 4-inch diameter plastic pipes were placed in each pit to allow access in the event that the pit wall collapsed. Initial observations indicated that floating oil was restricted to within 10 feet to the north and south of well MW-3, and within 20 feet to the west of MW-3.

A meeting was held between LFC and Ecology on October 20, 1989, to discuss the preliminary results of the test pit investigation. As agreed by consensus at the meeting, three of the seven test pits (in which floating oil was not observed during monitoring) were closed. Continued monitoring of the four remaining test pits for floating oil and recovery of detected oil was conducted through November 30, 1989. The results of these activities are described in a letter from LFC to Ecology dated December 5, 1989 (included as Attachment D).

In the December 5, 1989 letter to Ecology, LFC stated plans to close the remaining test pits on December 15, 1989, on the basis of the prior test pit monitoring and oil recovery results, and in consideration of the imminent expiration of the LFC lease of the property. As per the letter, the four remaining test pits were closed on December 15, 1989.

TEST PUMPING TO ASSESS PRESENCE OF OIL IN VICINITY OF WELL MW-2

The Ecology letter to LFC dated May 18, 1989, stated concern that the presence or absence of floating oil at the MW-2 location could not be accurately established because the prevailing groundwater level at this well location has been very close to or above the top of the well screen. This situation would not allow floating oil to enter the well, if product was present in the formation surrounding the well. Well MW-2 is screened from 4.7 to 14.7 feet below ground surface.

Pursuant to discussions with Ecology, a work plan was prepared on October 6, 1989 and reviewed by Ecology for test pumping well MW-2, to lower groundwater levels around the well and thus induce floating oil (if present) to enter the well. Two rounds of test pumping of well MW-2 were conducted, on September 6 and October 3, 1989. The results of these tests are summarized in Tables 2 and 3. As shown in the tables, no oil was observed in discharge from well MW-2, or in the well, at any time during the pumping or post-pumping periods.

CONCLUSIONS

Exploration, sampling, and oil recovery activities conducted at the LFC Seattle plant, pursuant to removal of three underground storage tanks in August 1987, indicate that:

a) residual petroleum products related to the former tanks were detected in the subsurface only in the vicinity of monitoring well MW-3, on the west side of the plant;

b) product (oil) in the vicinity of MW-3 is very limited in extent (within 20 feet of the well); and

c) volumes of recoverable oil in the vicinity of MW-3 have and will continue to decrease over time to very small quantities (oil sheens or dispersed droplets of oil that were recovered with sorbent booms, as recorded by the most recent onsite data).

RECOMMENDATIONS

Future activities at the site should be directed at completing the subsurface product assessment and recovery, and consist of:

a) measuring water levels and checking for the presence of floating oil in the three onsite monitoring wells (with a clear plastic bailer), bailing and collecting observable floating oil, and reporting data to Ecology on a monthly basis;

b) continuing this monitoring program until no floating oil is observed for three successive monthly monitoring events, at which time LFC will notify Ecology that the monitoring will be discontinued;

c) abandonment of the three onsite monitoring wells in accordance with WAC 173-160 and a well abandonment work plan approved by Ecology; and

d) documentation of the well abandonment with a brief letter report submitted to Ecology that includes as-built well abandonment drawings.

- close MW-3 too? why?
- no floating oil for 3 mo, then soil borings

Please contact me if you have questions or comments regarding this report.

Sincerely,

CH2M HILL

Michael R. Warfel
Project Manager

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Attachments -

A. Methods, Procedures, and Field Data for August 8, 1989 Groundwater Sampling

B. Laboratory Reports and Chain of Custody Forms for August 8, 1989 Groundwater Sampling

C. Geologic Logs of Test Pits Excavated in October 1989

D. Letter From Longview Fibre to Ecology dated December 5, 1989, Regarding Results of the Test Pit Investigation in the Vicinity of Well MW-3

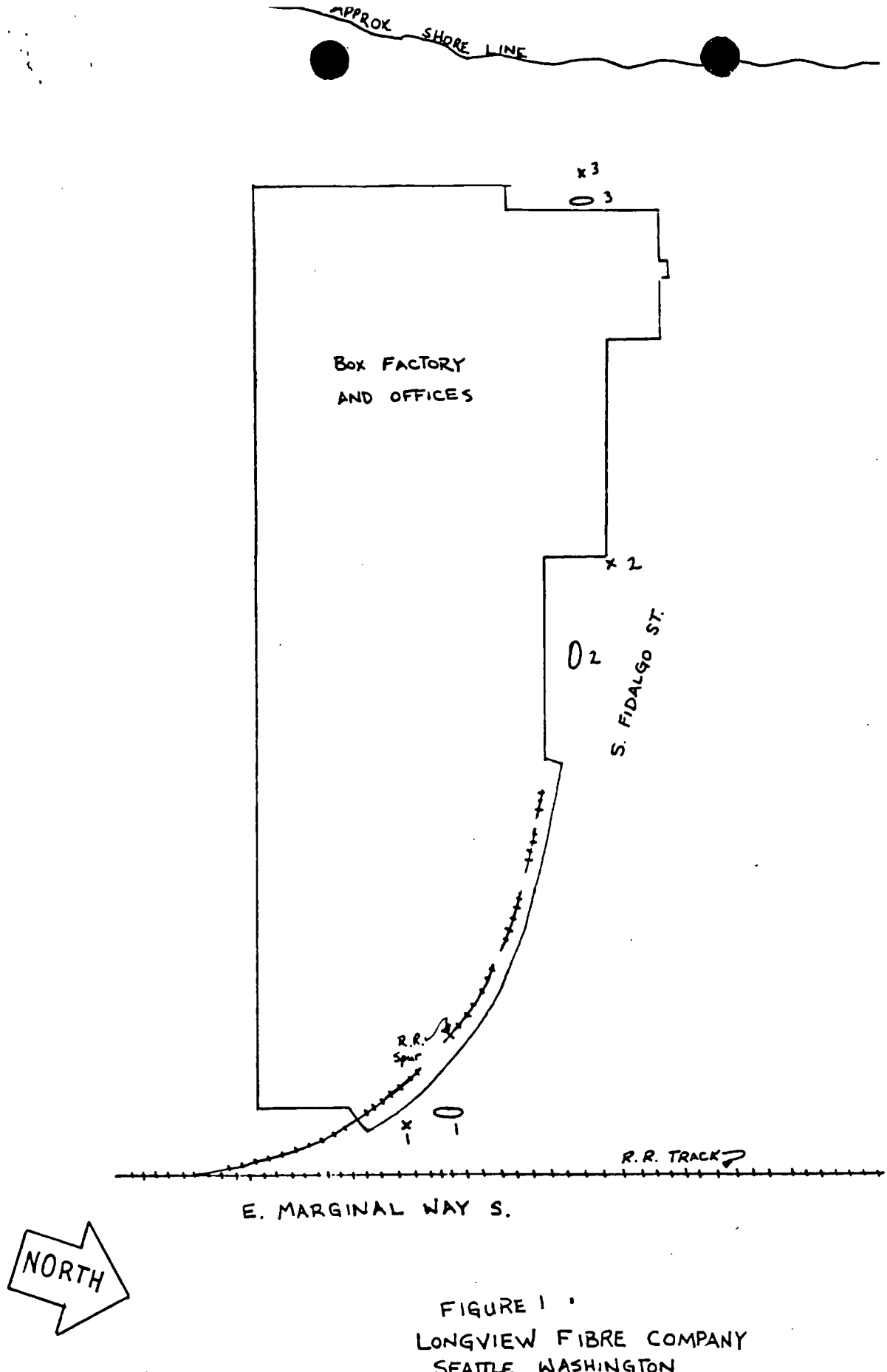

FIGURE 1 :
LONGVIEW FIBRE COMPANY
SEATTLE, WASHINGTON
SITE PLAN WITH APPROXIMATE TANK AND WELL LOCATIONS

KEY:
O FORMER TANK LOCATION
X WELL LOCATION

Table 1
TOTAL PETROLEUM HYDROCARBON DATA FOR
WATER SAMPLES COLLECTED ON AUGUST 8, 1989

Well Number	Total Petroleum Hydrocarbons, mg/L[a]
MW-1	0.28
MW-2	<0.05
MW-3	7,590
MW-4[b]	0.25

[a]By method 418.1.
[b]Equipment blank; collected immediately after sampling MW-3.

Table 2
DATA SUMMARY FOR FIRST PUMPING OF
MONITORING WELL MW-2 (SEPTEMBER 6, 1989)[a]

Description of Activity	Water Level (feet)[b]
Pre-pumping groundwater level	4.9
Pumped well 5 minutes (removed approximately 6.3 gallons); no oil observed in discharge	
Water level immediately after pumping stops	9.2
Water level 10 minutes after pumping stops	5.1
Pumped well 10 minutes (removed 13.5 gallons); no oil observed in discharge	
Water level immediately after pumping stops	7.0
Water level 10 minutes after pumping stops	5.25
Pumped well 15 minutes (discharge volume not recorded); no oil observed in discharge	
Water level immediately after pumping stops	10.0
Water level 10 minutes after pumping stops (3:13 PM)	5.35
Water level at 7:35 AM on 9-7-89; no oil observed in clear bottom-filling bailer dipped into the well	5.35

[a]Data collected by Longview Fibre personnel.
[b]Feet below top of casing; well screen interval is 4.5 to 14.5 feet below top of casing.

Table 3
DATA SUMMARY FOR SECOND TEST PUMPING OF MONITORING WELL MW-2 (OCTOBER 3, 1989)[a]

Description of Activity	Water Level (feet)[b]
Pre-pumping groundwater level	5.07
Pumped well 150 minutes (removed 166.9 gallons); no oil observed in discharge	
Water level immediately after pumping stops	13.6
Adjusted pump to acheive water level drawdown of approximately 9 feet; pumped well 90 minutes (removed approximately 80 gallons); no oil observed in discharge	
Stopped pumping and allowed water level to stabilize; no oil observed in clear bottom-filling bailer dipped into the well	5.5

[a]Data collected by Longview Fibre personnel.
[b]Feet below top of casing; well screen interval is 4.5 to 14.5 feet below top of casing.

ATTACHMENT A

METHODS, PROCEDURES, AND FIELD DATA
FOR AUGUST 8, 1989 GROUNDWATER SAMPLING

Groundwater samples were collected at Longview Fiber Company's Seattle plant on Tuesday August 8, 1989. The wells sampled were identified as MW-1, MW-2, and MW-3.

Water level measurements were taken from the three monitoring wells at varying times due to equipment parked over the surface completions. The following represents the depth to water below the top of the PVC casing:

Well No.	Depth To Water (feet)	Oil Measured (feet)	Time
MW-1	9.06	0.0	1056
MW-2	5.00	0.0	0950
MW-3	6.22	0.09	1015

The first well to be sampled was MW-3, where the floating oil was observed. The sample team attempted to remove the oil prior to sampling. Twenty-two gallons of water with traces of floating oil was removed before the well appeared free of oil. The water purged was placed into a 55-gallon drum for future disposal by Longview Fiber. The following data was obtained in the field during the sampling:

Gallons Removed	pH	Specific Conductance	Temperature
22	6.91	600 umhos/cm	21 °C
24	7.60	600 umhos/cm	20 °C
25	7.56	600 umhos/cm	20 °C

A clean stainless steel bailer was then used to collect the sample and place it into a 1-liter amber glass jar with a teflon lined lid, provided by the laboratory. The sample was collected, placed on ice, labeled, and placed under chain-of-custody procedures. The sample was identified as LFC-MW3-8/8/89.

The second sample collected was an equipment blank prepared by pouring store bought distilled water through the decontaminated stainless steel bailer directly into the sample container. The procedures used on MW-3 were then followed and the sampled was identified as LFC-MW4-8/8/89.

The third sample collected was MW-2. The following data was collected while purging this monitoring well:

Gallons Removed	pH	Specific Conductance	Temperature
1	7.66	360 umhos/cm	22 °C
2	7.46	490 umhos/cm	20 °C
4.5	7.50	500 umhos/cm	20 °C

The sample handling procedure identified for MW-3 were followed and the sample was labeled LFC-MW2-8/8/89.

Monitoring well MW-1 was the final sample collected and the following data was collected in the field:

Gallons Removed	pH	Specific Conductance	Temperature
0	7.11	340 umhos/cm	22 °C
2	7.15	350 umhos/cm	22 °C
3	7.16	345 umhos/cm	22 °C
4.5	7.15	360 umhos/cm	23 °C

The samples was collected following the procedures identified for MW-3 and the samples was labeled LFC-MW1-8/8/89.

All field monitoring equipment was calibrated prior to starting field work. The samples were shipped to CH2M HILL laboratory in Redding, California.